UNIVERSITY OF MALAYA
UMR
UNIVERSITY OF MALAYA RESEARCH

Bulletin

Volume 1 2014

MEDIA EVENT @ UM

AWARD WINNING RESEARCHER

MTE 2014 Best Biotechnology Award (The Japan Intellectual Property Association - JIPA)

RESEARCH HIGHLIGHTS

CENTRE OF EXCELLENCE

The UMR Bulletin Team

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This is my fifth preface in the UM Research Bulletin. It has been an eventful 21 months and UM research is going from strength to strength. Our ISI-indexed publications have now reached 2,500 for the year 2013, making us the first Malaysian university to breach the 2,000 mark (in 2011) and 2,500 mark (in 2013). Our Scopus-indexed publications have also breached the 3,000 mark in 2013, another first by a Malaysian university.

In January 2014, we launched the revamped Cluster structure for UM. These 6 new clusters (which replaced the previous 8) are truly trans-disciplinary in nature. We also went on an extensive road show to all faculties promoting the Grand Challenge initiative, the first by any Malaysian university. These Grand Challenges are different from the usual projects and programmes in that they will not only focus on publications and IPRs but will be researching real world solutions to real world problems. Only five themes will be prioritised this time around. We hope to award the Grand Challenge programmes soon and we think this will be the way that research in Malaysia and elsewhere will be carried out in the future.

We are also starting to collaborate with the Department of Museums and National Science Centre. Our commercialisation pace is picking up now with a record number of patents filed and granted.

An experiment with Springer started with the IJMME in January 2014 with the aim of making the IJMME an ISI-indexed journal.

More upcoming strategies in the next bulletin. Have a great year in 2014.

Professor Dr. Awg Bulgiba Awg Mahmud
Deputy Vice-Chancellor (Research & Innovation)

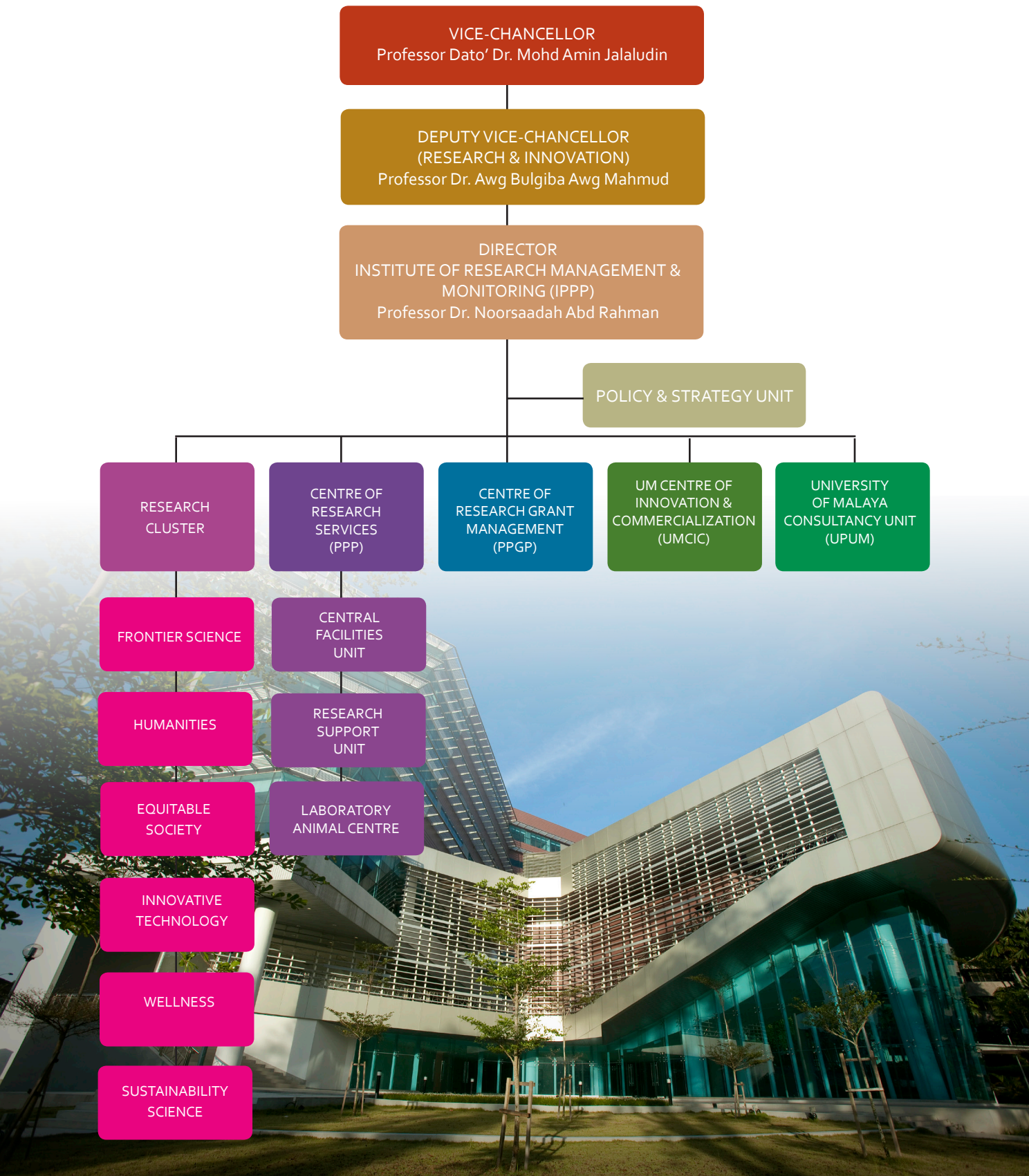
Contents

This year marks another year of UM as a one of Malaysia's Research University. The RU audit team came in February and the result of the audit puts UM at the forefront of all RUs. So, what have we achieved for the past 7 years as a research university? Our publications have soared from 499 publications in the WoS-Indexed journals since the inception of RU in 2007 to 2425 WoS-indexed publications in 2013 (data up till 31/3/2014). In addition to that, the total percentage published in the 1st quartile (Q1) and 2nd quartile (Q2) surpasses 50% of the total publications for UM in 2013. This is indeed a good achievement from the RU initiatives. Our researchers are able to benefit from the funding and support given to be able to produce good works that are internationally accepted as indicated by these publications. However, we still need to show how the university's research programmes impact and benefit the society. These are intangible outcome and are more difficult to measure.

Moreover, for a research outcome to impact the society, researchers have to approach their research in a different way. More often such research programmes are multi- and trans-disciplinary in nature. Being mindful of this, we at the IPPP and Research Clusters have launched a new initiative, which is the Grand Challenge Programme. The idea is to encourage our researchers to think of trans- and multi- disciplinary approach to solve common problems. We have picked 5 themes for the Grand Challenge to begin with. They are (i) Active Aging, (ii) World Without Conflict, (iii) Eco-Resilient Cities, (iv) Sustainable Resources and Technology and (v) Pushing Economic Borders. We hope that with these programmes, our researchers are not only known as excellent researchers academically but are also known to provide solutions that will impact and benefit the society. As a result, UM will not only be a leader in research and innovation but also a university with a heart.

Professor Dr. Noorsaadah Abd Rahman
Director of IPPP

ORGANIZATION CHART
INSTITUTE OF RESEARCH MANAGEMENT & MONITORING (IPPP)



Media Event @ UM Showcasing Research Universities Success Series 1: Publication

The press conference to showcase the achievements and success of the five Research Universities in Malaysia. From (right) VC of UPM, USM, Minister of Education II , VC of UM, UKM and UTM

The press conference and exhibition held on 24 February 2014 at the Research Management and Innovation Complex, University of Malaya, was aimed at showcasing the achievements and success of the five Research Universities in Malaysia. The universities are University of Malaya (UM), Universiti Sains Malaysia (USM), Universiti Kebangsaan Malaysia (UKM), Universiti Putra Malaysia (UPM) and Universiti Teknologi Malaysia (UTM).

Research Universities have a mission to become the engine of growth for the nation, create opportunities for students and scholars to exchange ideas and conduct research in a conducive environment that brings to life creativity and exploration of knowledge frontiers, generates wealth, and improve the quality of life.

Since obtaining Research University status in 2006, the country's research activities and output have shown tremendous increase, which proves that higher learning institutions in Malaysia can be on par with reputed universities in the world. The recognition given to the five universities signifies the aspiration to elevate and strengthen the positions of our public higher learning institutions internationally.

The exhibition also showcased innovations and outputs from each Research University that were directly related to research efforts sponsored under the Research University Fund.

Professor Dr. Adeeba Kamarulzaman

Professor Dr. Harith Ahmad

This is the first in a series of media events to be organized in turn by each Research University, with each event highlighting the focus areas of the respective Research Universities'. For this first event, organized by University of Malaya, achievements in publications were the focus.

Publications in indexed journals and academic books are the main method accepted by the international research community to disseminate research findings as it ensures that manuscripts are critically reviewed by experts with emphasis on validity and integrity in order to justify the reported findings.

Publications in indexed journals are also an important criterion in university rankings and Nobel Prize nominations. Indexed publications are where knowledge or research findings are preserved, to be referred to by generations to come, and which could become the basis for future inventions. Publications also make an objective measure of an academic's achievement and stature.

Hence, the remarkable increase in the numbers of journal publications in Malaysia since Research Universities began shows that our researchers are being recognized by international scholars and are of international standard. This augurs well for the country's image from the perspective of research and higher education in attracting foreign investors and prospective stakeholders.

Although papers published in professional or academic journals may only be read by a limited audience, the general public should nevertheless appreciate that many a great work published by early scientists have affected our daily lives in one way or another. For example, we owe the existence of motors, transformers, dynamos, even fibre optics that are used to connect the world and that makes Internet possible – to the four Maxwell's Equations on electromagnetism, published in 1861 by the Scottish physicist James Maxwell.
Translation of research output into the practical world may happen soon after a research is completed, or it may take years to be applicable especially with intellectuals who think far ahead of their time. Having the original findings written and published in a scientific way enables the next researcher to trace the origin and evolution of ideas, before continuing in the direction of their own research.

While not all researchers will become famous for their discoveries, every researcher has the opportunity to make a mark in his or her career and be known in the world, by having his or her work in print.

University of Malaya, as the nation's first university has, to date, produced over 20,000 research articles in reputed academic journals. This commendable feat has gained us more than 43, 000 citations and a university total H-index of 91 as of 1 April 2014. UM's areas of strength in publishing include medicine, physics and astronomy, material science, chemistry, as well as social science. To name a few prolific researchers, 2010 Merdeka Award recipient Professor Dr. Harith Ahmad, an expert in laser technology has published more than 400 research articles with more than 2000 citations and an H-index of 25. He has made an immense contribution to the development of photonics technology in Malaysia through his collaboration with TELEKOM Malaysia.

Minster of Education II visited the Publication Gallery

Professor Dr. Adeeba Kamarulzaman, presently Co-Chairman of the WHO Strategic and Technical Advisory Committee on HIV, an Executive Committee Member of the International Society of Infectious Diseases and a Governing Council Member of the International AIDS Society, was recently named as one of the Top 20 most influential Muslim women in science by Muslim-Science. Her achievements in research have been recognised through several national and international awards. Besides the Tun Mahathir Science and the Merdeka Awards, she was also honoured at the Advance Australia Awards as the first recipient of the Advance Global Award in the category of Alumni in 2012 and received the Australian Education Achievement Award in the same year. She has published more than 120 research articles with total citations of 2400 and an H-index of 25.

University of Malaya along with the other Research Universities will continue to strive forward in research and innovation, to become a major contributor of knowledge and ideas in the global arena, by keeping abreast with the latest developments in the conduct of research and communication of research findings.

Having a learned society is a significant aspect of being a developed nation, and this is in line with the objectives of the National Higher Education Strategic Plan, to create a group of highly educated human resource as a catalyst for research and innovation, and to ensure the success of innovation-based economic advancement. Under this programme, the Government has set a target to have 60,000 PhD holders amongst the Malaysian population by 2023.

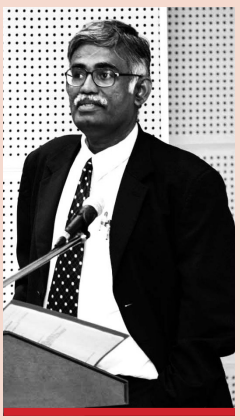
Research Universities, having been recognized by the Cabinet as a hub for education and research excellence in Malaysia, play an important role in achieving this target, be it in the training of postgraduate candidates or in setting a suitable framework to move and utilize the knowledge and skills attained by those graduates.

Exhibition During Media Event @ UM

Karnival Jom Masuk UM 2014 (18-19 April 2014)

IPPP also took part in the Karnival Jom Masuk UM 2014, held in Kompleks Perdana Siswa. IPPP showcased the Infra Lab facilities and services.

Karnival Jom Masuk UM 2014

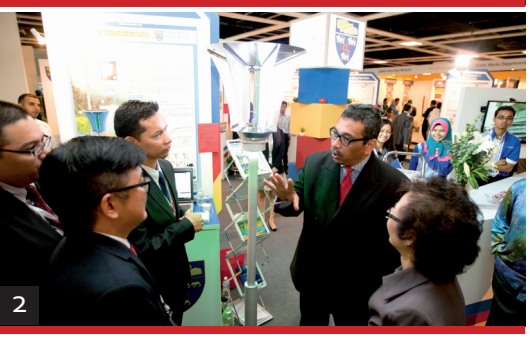


LEFT - RIGHT Profesor. Dr. Sazaly Abu Bakar, Profesor. Dr. Abdul Kariem Bin Hj Mohd Arof, Profesor. Dr. Rajah A/L Rasiah and Profesor. Dr. Masjuki Bin Haji Hassan

Talk on 'How to Write a Winning FRGS Grant Proposal' (18th Feb 2014)

The objective of this talk was to help researchers in writing a winning proposal for FRGS grant. From this talk the participants will understand the criteria and requirements that are crucial in preparation of a good grand proposal.

This talk was held at Auditorium IPPP, Research Management and Innovation Complex, UM with 180 participants. The speakers for this event were: Profesor. Dr. Sazaly Abu Bakar, Profesor. Dr. Abdul Kariem Bin Hj Mohd Arof,Profesor. Dr. Masjuki Bin Haji Hassan and Profesor. Dr. Rajah A/L Rasiah.



Malaysia International Technology Expo (MTE) 2014

1.The opening ceremony by Y.B Datuk Dr. Abu Bakar bin Mohamad Diah

2. Y.B Datuk Dr. Abu Bakar bin Mohamad Diah visited University of Malaya Booth

3. MTE 2014 Judging in progress

4. Dr. Jayakumar Natesan Subramaniam with his award

5. Prof Dr. Ramesh Singh received his JIPA Awards from the organizer

The 13th Malaysia International Technology Expo (MTE) 2014 was held at the Putra World Trade Centre (PWTC) from 20 -22 February 2014. MTE is an annual event with more than 500 exhibits of platform inventions and innovations to a targeted audience of trade visitors. Invention & Innovation Awards 2014 and the Malaysia International Design Expo & Awards 2014 (mIDEAS) were held in conjunction with this event. Both awards which recognize excellence in innovative technologies were organized by the Malaysian Association of Research Scientists (MARS).

Since 2001, the MTE has evolved to be the leading international invention and innovation Expo in the region. MTE 2014 is the platform and gateway for inventors, innovators, scientists and entrepreneurs to showcase their findings. The aim of MTE is to introduce these new innovations to targeted trade visitors and market.

This year, University of Malaya participated with 13 research projects and had a hugely successful outing bagging 14 Awards in total (1 Best Award, 1 JIPA Award, 5 Gold Medals, 6 Silver Medals and 1 Bronze Medal).

The Best Award went to the invention on 'Mass Production of Carbon Nanotubes using microwave technology' by Dr Jayakumar Subramaniam, from the Faculty of Engineering) while Professor Ramesh Singh, received the JIPA Award, the BEST BIOTECHNOLOGY AWARD conferred by the Japan Intellectual Property Association on his invention 'Production of high quality Bo-HA with Natural Structure from Bovine Bone'.

MTE 2014 Results

No	NAME OF RESEARCHERS	TITLE	FACULTY	AWARD
1.	Dr. Jayakumar Natesan Subramaniam (PI) Mr. Mubarak Mujawar Prof. Dr. Ezzat Chan Abdullah Dr. Narayan Sahu Dr. Poobalan Ganesan	Mass production of carbon nanotubes using microwave technology	Department of Chemical Engineering, Faculty of Engineering	THE BEST AWARD and GOLD
2.	Prof. Ramesh Singh (PI) Prof. Mohd Hamdi Abdul Shukor Aliasghar Niakan Dr. Tan Chou Yong	Production of High Quality Bio-HA with Natural Structure from Bovine Bone	Department of Mechanical Engineering, AMMP Faculty Engineering	GOLD JIPA Award (Biotechnology)
3.	Dr. Ramesh Kasi (PI) Prof. Dr. Abdul Kariem Arof Prof. Dr. Ramesh T. Subramaniam Ms. R. Shanti Rajantharan Mr. Ng Hon Ming Mr. Mohd Zieauddin Kufian Dr. Vengadaesvaran Balakrishnan Dr. Ezra Morris Abraham Gnanamuthu Dr. Chee Swee Yong	γ-irradPE: Biopolymer in Renewable Energy Development	Center for Ionics University Malaya (C.I.U.M) Department of Physics Faculty of Science	GOLD
4.	Dr. Chong Wen Tong (PI) Prof. Dr. Masjuki Haji Hassan Prof . Dr. Loo Chu Kiong Mr. Poh Sin Chew Mr. Wan Khairul Muzammil Abdul Rahim Mr. Ahmad Fazlizan Abdullah Ms. Yip Sook Yee Mr. Hamid Taheri Mr. Mohammed Gwani Mr. Afshin Aslian	Light-Glowry - Innovative Renewable Energy Powered Emergency Beacon	Department of Mechanical Engineering Faculty of Engineering	GOLD
5.	Dr. Ghafour Amouzad Mahdiraji (PI) Prof. Dr. Faisal Rafiq Mahamd Adikan Elian Dermosesian Mostafa Ghomeishi Ung Ngie Min Jong Wei Loong	Accurate Radiation Capturing Glass	Photonics Research Group (PRG) Department of Electrical Engineering Faculty of Engineering	GOLD
6.	Prof. Dr. Misni Misran (PI) Dr. Teo Yin Yin Woo Juin Onn Yew Han Choi Vicit Rizal	Nanostructured lipid carrier (NLC) as a vehicle for drugs delivery	C217, Colloid Lab, Chemistry Department, Faculty of Science	GOLD

7.	Prof. Dr. Ramesh T.Subramaniam (PI) Prof. Dr. Abdul Kariem Arof Dr. Ramesh Kasi Ms. R. Shanti Rajantharan Mr. Ng Hon Ming Mr. Mohd Zieauddin Kufian Dr. Vengadaesvaran Balakrishnan Dr. Ezra Morris Abraham Gnanamuthu Dr. Chee Swee Yong	Temperature sensible Adhesion Polymer Electrolyte : A Smart Separator for Electric Power Generation	Center for Ionics University Malaya (C.I.U.M) Department of Physics Faculty of Science	GOLD
8.	Dr. Ching Yern Chee (PI) Prof. Dr. Gan Seng Neon Mr. Chong Kok How Ms. Kalyani Nadarajah Mr. Choo Min Yee Golden Cont. Chemical (M) Sdn. Bhd.	LSAS Ultimate® : A Low Surface Energy & Excellent Anti Scratch Protective Film	Department of Mechanical Engineering, Faculty of Engineering	GOLD
9.	Prof. Dr. Tunku Kamarul Zaman (PI) Dr. Tan Sik Loo Prof. Dr. Tunku Sara Assoc. Prof. Dr. Lakshmi Selvaratnam Prof. Dr. Azlina Abbas Assoc Prof. Dr. Ng Wuey min	Growth differentition factor 5 (GDF5)-induced bone narrow stromal cells (MSC) for tendon repair	Tissue engineering Group (TEG) National Orthopedic Centre of excellence for Research and Learning Department of Orthopedic Surgery Faculty of Medicine	GOLD
10.	Dr. Azuddin Mamat (PI) Prof. Dr.Imtiaz Ahmed Choudhury Prof. Dr.Zahari Taha Assoc. Prof. Dr. Nukman Yusoff	Macro and micro part fabrication using vertical injection molding machine	Department of Mechanical Engineering, Faculty of Engineering	SILVER
11.	Dr. Ching Yern Chee (PI) Prof. Dr. Iskandar Yaacob Idris Dr. Nor Hafizah Ramli Ms. Lim Ka Min Mr. Choo Min Yee Golden Cont. Chemical (M) Sdn. Bhd.	Ag-BioLac : An effective Antivirus and Anti-Drip UV Absorber for Agricultural Applications	Department of Mechanical Engineering, Faculty of Engineering	SILVER
12.	Dr. Ahmed Aly Diaa Mohammed Sarhan (PI) Bizhan Rahmati Mohd Sayuti Ab Karim	Molybdenum Disulphide Nano Based-Lubricant for Improving Machining Process by More Power saving and less oil consumption and pollution.	AMMP Research Centre Department of Mechanical Engineering Faculty of Engineering	SILVER
13.	Assoc. Prof. Dr. Thorsten Heidelberg (PI) Abbas Abdualmeer Salman	Biofunctionalization of Inorganic Nanoparticles	Department of Chemistry	SILVER

MTE 2014 Best Biotechnology Award (The Japan Intellectual Property Association - JIPA)

Production of High Quality Bio-HA with Natural Structure from Bovine Bone

The Invention

The present invention relates to a method of manufacturing bone graft material which can be efficiently delivered, strongly resistant to infection and has an excellent ability to encourage bone growth. Bone grafting is used to fill cavities of bone tissue that is damaged due to bone diseases or bone ailments, including bone tumours, or to induce bone fracture healing, bone healing and joint fixation. Recently, in response to the increase in the elderly population and improvement in the quality of life due to the development in the medical sciences, the need for bone grafting is gradually increasing. This invention provides a process for producing hydroxyapatite (HA) with a natural structure from bovine bone.

Bovine bone can be considered as a waste material which has no value in its original state and the disposal of such material can pose serious risk to public health, contamination of water resources and the environment. From the material science point of view bovine bone is a rich source of calcium phosphate hydroxyapatite (HA) which, through careful processing, could render it to be a very important natural source of bioceramic for use in clinical applications. Hydroxyapatite is an extraordinary material used for implantation purpose due to its excellent biocompatibility with human hard tissues. Bovine bone HA has a very similar structure to human bone mineral and it's composed of 50% calcium phosphate by weight. This invention is about a novel method

Prof Ramesh and team members receiving the JIPA award from the representative from MTE2014

of producing phase pure HA from bovine bone which can be subsequently tailored to exhibit exceptional mechanical properties coupled with fine microstructure. This new Bio-HA has great potential to meet the growing demand for bone-like substitutes for maxillofacial surgery, as solid implants for orthopaedic applications, as bone graft substitution and as biocompatible coatings on metallic implants.

The Inventor

Dr Ramesh Singh is currently a Professor in the Department of Mechanical Engineering at the University of Malaya (UM), Malaysia. He graduated with a 1st Class Honours degree in Mechanical Engineering in 1994 and received his PhD in advanced ceramics in 1997, both from the University of Sunderland, UK. He has published more than 250 research articles in various ISI/WoS- and Scopus-listed publications and has also secured more than USD 1 million in research funding. He has filed 7 Malaysia Patents (4 granted) as principal inventor pertaining to development of advanced ceramics and powder processing methods. Professor Ramesh is currently the Deputy Dean (Development) in the Faculty of Engineering. As a Professor in Engineering, he provides leadership and direction not only in academic matters but also in research, particularly in the area of manufacturing, mechanics, failure analysis, design and engineering materials. His contribution is well recognized by his peers locally and internationally and he sits on the technical panel (ISO/TC 206) in Malaysia for the development of national MS standards and International Standards (ISO) on fine ceramics. He has provided consultancy services on the development of advanced ceramics for industrial applications and has served as an external assessor/examiner to several degree programmes in several universities in the country in the area of mechanical, manufacturing and materials engineering.

Professor Ramesh was recently conferred the Top Research Scientist Malaysia (TRSM2012) award by the Academy of Sciences Malaysia for his excellent contribution to the enhancement in science and technology in Malaysia. He was also the recipient of the prestigious IEM Young Engineer Award 2004 and won more than 50 awards at international/national exhibitions pertaining to his research work. He was selected as the top 12 "Malaysia Engineer Stars" by the Institution of Engineers Malaysia in March 2011 for his notable contribution to the nation in the field of engineering education and advancement in ceramics engineering in the country. He is a Chartered Engineer registered with the Engineering Council UK, a Chartered Professional Engineer (CPEng.) registered with the Engineers Australia, a Professional Engineer (PEng.) registered with the Board of Engineers Malaysia and Fellow of five prominent societies; the Institution of Mechanical Engineers (IMechE) UK, the Institution of Engineers Australia (IEAust), the Institute of Engineers Malaysia (IEM), Institute of Materials Malaysia (IoMM) and the Malaysian Scientific Association (MSA). He is an active Panel Member of the Engineering Accreditation Council (EAC), serving as an International Industrial Advisor for Fellow membership application with the IMechE UK and has mentored more than 60 colleagues towards the attainment of the Chartered Engineer status with the Engineering Council of UK and the Professional Engineer status with the Board of Engineers Malaysia. He is on the international Editorial Board of Ceramics International (a Q1, Elsevier Publication), the Editor in Chief of the Journal of Mechanical and Materials Engineering (a Scopus-listed publication by UM), Editorial Board Member of the Journal of Institute of Materials Malaysia and Journal of Industrial Technology. He is also an active international reviewer for numerous ISI/WoS and Scopus journals. Professor Mohd Hamdi Abdul Shukor, Aliasghar Niakan and Assocate Professor Dr. Tan Chou Yong were also part of this team.

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WELLNESS RESEARCH CLUSTER

Grand Challenge - Active Ageing
Challenge Driven Research in Active Ageing

Overview

Grand Challenges are generally the toughest, biggest and most complex problems faced by humanity. The scope of humanity's Grand Challenges extends from poverty, energy, education, global health, security, and to the exploration of space. Grand Challenges affect billions of people, and only the development of exponential technologies can solve them. Thus Grand Challenge is establishing a challenge-driven research, focusing on societal issues of interest to global, national and local stakeholders (Leijten et al., 2012). The idea of Grand Challenge can be traced back to 1900s when Dr. David Hilbert listed 23 challenges in mathematics (Hilbert, 2000). His list of Grand Challenges has promoted breakthrough and innovation in mathematics research ever since. Societies are now facing interlinked and complex challenges, and therefore requires new research strategies, governance models and funding scheme as a way to move forward (Leijten et al., 2012). Grand Challenge offers big, publicity-fostering financial rewards, and ambitiously strives to revolutionize or incentivize solutions to societal issues. Grand Challenge therefore aims to focus considerable attention on specific issues and mobilize a motivated community of problem solvers. Implicit in this approach is good quality research, defining the issues and proof of concept of any submitted solutions, ensuring that innovations have objectively proven their worth in practice and under rigorous conditions.

The Grand Challenge approach begins with examining societal challenges and the demands for innovation, which then calls for radical innovations and breakthrough solutions for societies (Figure 1). Helbing (2012) described that Grand Challenge approach can stimulate research progress and guide towards new scientific discoveries.

Why run a Grand Challenge Program?

- Draw attention to the problem
- Solve a major and complex problem that achieves high impact
- Build and develop an innovative community
- Source new ideas from unexpected fields
- Promote one's brand and cause
- Create new markets
- Maximize return-on-investment (ROI)

Why active ageing?

The Malaysian population of those 60 years and

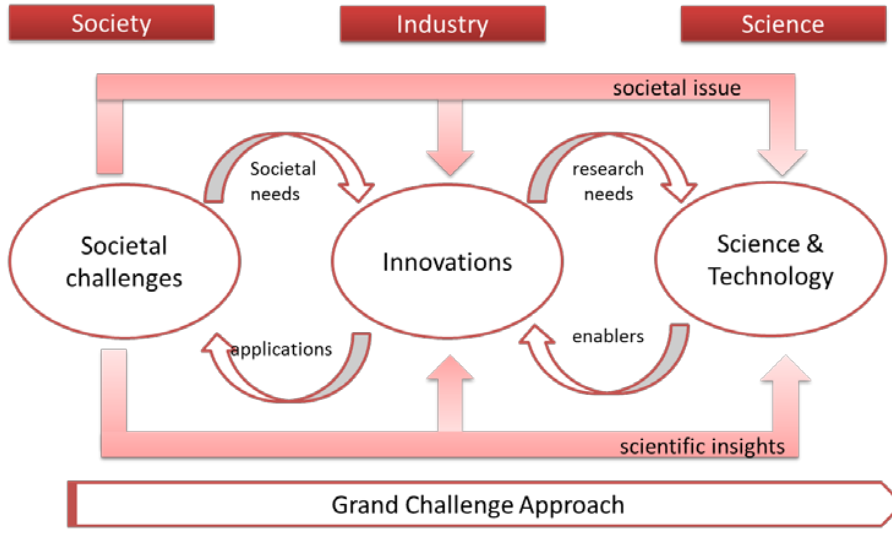

FIGURE 1
Grand Challenge approach is initiated or inspired by societal challenges (adapted from Leijten et al. (2012).

WELLNESS RESEARCH CLUSTER

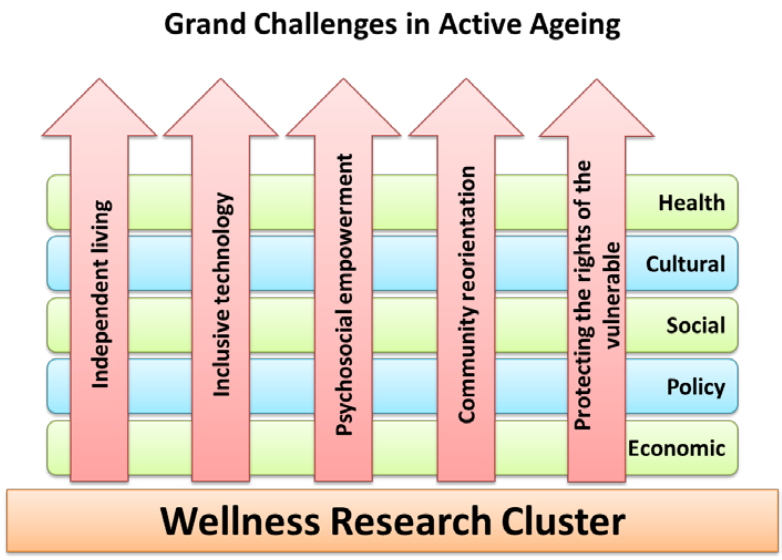

FIGURE 2
Grand Challenges in Active Ageing

above is increasing steadily from 5.7% in 1990 to 6.3% in the year 2000. This is expected to increase to 9.8% in the year 2020 (Mafauzy, 2000). The World Health Organization states that countries can afford to get old if governments, international organizations and civil society embraces active ageing policies and programmes that enhances health, participation and security for the of elderly (World Health Organization, 2002). Malaysia needs to swiftly develop relevant systems to cope with its rapidly ageing population (Forsyth and Chia, 2009), as it will pose new and unforeseen challenges on both health and social services (Karim, 1997).

Is population ageing in Malaysia an opportunity or a challenge? Are we ready and prepared to face the increasing pressure of an ageing population? Thus, in view of national importance and enormity of the potential issues and the pool of experts from the University of Malaya, Active Ageing as one of the Grand Challenges to be tackled. Grand Challenges in active ageing is also aligned with the Tenth Malaysia Plan (2010-2015), which Malaysia has identified as a priority area to ensure the health and well-being of older citizens. This is to facilitate ageing with dignity and respect, while at the same time ensuring independent and fulfilling lives as integral members of their families, community and country (Economic Planning Unit, 2010). In addition, the government has identified the needs of senior citizens as a business opportunity in the Economic Transformation Programme in 2012 (PEMANDU).

Grand Challenges in active ageing is meant to overcome identified the bottlenecks to ensure optimum opportunities for health, participation and security as people age. To address the Grand Challenges in active ageing, the Wellness Research Cluster has identified five (5) research priorities or themes to focus on for the next 3-5 years. These research priorities are Independent living, inclusive technology, psychosocial empowerment, community reorientation, and protecting the rights of the vulnerable. These themes will cut across health, cultural, social, economic and policy issues (Figure 2).

The Wellness Research Cluster invites University of Malaya researchers to respond to the Grand Challenges in active ageing by undertaking trans-disciplinary and outcome-based research focused on the five aforementioned themes, in order to materialize active ageing as a reality in Malaysia. The time to act is NOW.

References

Forsyth, D. R., & Chia, Y. C. (2009). How should Malaysia respond to its ageing society? Medical Journal of Malaysia, 64(1), 46-50.

Hilbert, D. (2000). Mathematical problems. Bulletin (new series) American Mathematical Society, 37(4), 407-436.

Karim, H. A. (1997). The elderly in Malaysia: demographic trends. The Medical journal of Malaysia, 52(3), 206-212.

Leijten, J., Butter, M., Kohl, J., Leis, M., & Gehrt, D. (2012). Investing in research and innovation for grand challenges. Belgium: Joint Institute for Innovation Policy.

Mafauzy, M. (2000). The problems and challenges of the aging population of Malaysia. The Malaysian journal of medical sciences: MJMS, 7(1), 1.

PEMANDU. Economic Transformation Programme. Retrieved 17 March 2014, from http://etp.pemandu.gov.my/

Unit Economic Planning. (2010). Tenth Malaysia Plan 2011-2015. Putrajaya, Malaysia: Economic Planning Unit, Prime Minister's Department Putrajaya.

World Health Organization. (2002). Active ageing: A policy framework.

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Grand Challenge
World without Conflict

We live in a world where people with diverse ideas, values, beliefs, cultures and languages coexist and therefore maintaining peace is often a great challenge. Given the reality of this world we live in today, peace and harmony are much sought after to prevent, counter and resolve conflicts that diminishes the quality of life. These conflicts may be caused by some of the world's profound problems such as tensions between nations, ideologies, faiths and cultures; threats from social interaction and miscommunication; and the risk of social, economic and political changes that are motivated by the taste of domination or power struggle. In addition, rapid modernization arising from industrialization, technology development, globalization, is met with the absence of education, inequitable access, and lack of equity, to name but a few, often create tensions and struggles especially in war-torn societies.

For peace to reign, dialogical efforts, negotiation, and conflict resolution may not be sufficient to foster sustainable harmony between the conflicting parties. Hence, at the crossroads of diversity, it is imperative for novel, creative and innovative methods in interdisciplinary research to be employed to understand, analyse and interpret factors which create conflict; and ultimately to devise ways of achieving respectful communication that embraces great differences in perceptions, ideas, views and attitudes.

Three central themes have been identified within this grand challenge:

1. Social cohesion,
2. Enhanced quality of life, and
3. Education and equitable development

Social cohesion

Social cohesion is a broad concept which usually refers to the unity of a group in which its members are committed in working towards a goal while they share some attractions among themselves and with the group as a whole (Beal et al. 2003; Carron & Brawley 2000). Carron & Brawley (2000) further describe some important aspects of cohesiveness which include 'multidimensionality' (dependency of cohesion on many factors), 'dynamic nature' (changes over time), 'instrumental basis' (the purpose of cohesion) and 'emotional dimension' (the appeals that are pleasing its group members).

In terms of public policy, State of the English Cities reports (Communities and Local Government n.d.) in UK, there are 5 different dimensions of social cohesion, namely:

- material conditions - fundamental and necessities of life such as employment, income, health, education and housing that are indicators of social progress
- social order (or passive social relationships) - safety and freedom from fear, tolerance and respect among people, peace and security towards societal harmony
- positive interactions (or active social relationships) - exchanges and networks; contacts and connections for establishing mutual support, trust and information
- inclusion - social integration; sense of belonging and shared experiences, identities and values
- equality - social fairness or disparity in access to opportunities or material circumstances

Enhanced Quality of Life

Quality of life or QOL is often confused with the concept of standard of living. However, the latter is based primarily on income and wealth, employment, purchasing power and possibly financial assets. It also refers to the general well-being of individuals, communities or societies that relates to quality indicators of the built environment, health, education, recreation, and social belonging. (Gregory et al. 2009; Martha & Amartya 1993). Other related concepts may include freedom, human rights, happiness, human security and harmonious living.

According to Kahneman & Deaton (2010), a personal well-being can be further categorised into 2 aspects, namely, the 'emotional well-being' and 'life evaluation'. Hence, the quality of life may sometimes be measured by the level of emotional experiences such as joy, stress, anger, affection, and so on, and general living conditions/situations that affect productivity. NGOs, the government, humanitarian aiders, politicians, economists and the public play important roles in both national and international development to ensure prosperity and harmony towards enhancing the quality of life.

Education and Equitable Development

Education is undoubtedly the key for any country's economic growth and national development. An inclusive approach to education development

HUMANITIES RESEARCH CLUSTER

embraces the concept of Education for All (EFA, by UNESCO) that mandates all international efforts involving governments, development ministries/agencies, NGOs, media, and civil society to achieve the global pursuit of Millennium Development Goals (MDGs) for universal primary education and gender equality in education by 2015.

'Putting quality education at the heart of the development' (UNESCO, n.d.) is the hallmark of UNESCO's mission regarding education for the 21st century. Therefore, what is needed by educational systems are: 'a holistic and humanistic vision of quality education, the realization of everyone's rights to education, [and lastly] the belief that education plays a fundamental role in human social and economic development' (UNESCO, n.d.). In addition, issues of equity, access, and quality of education are central for effective education systems and policy changes. These concerns are further explored by focusing on various educational goals to ensure early childhood education, primary education for all, life-long learning and skills development for young people and adults, increased adult literacy, gender parity/equality and improved quality of education.

In the Malaysian context, for example, the Malaysian Education Blueprint 2013 -2025 has outlined five aspirations towards a holistic education system that embeds: 'access' (equal opportunities to education), 'quality' (excellent education), 'equity' (parity education that reduces the rural-urban, socio-economic and gender gaps/divide), 'unity' (shared experiences and aspirations), and 'efficiency' (maximising student outcomes in comparison with the resources channelled into the system). In line with the National Education Philosophy, the Blueprint also seeks to facilitate student's attainment of knowledge, thinking skills, leadership qualities, bilingual proficiency, ethics and spirituality, and national identity (Ministry of Education Malaysia 2013, p. 18-21). Therefore, inspired by a strong level of commitment for education and equitable development, the government of Malaysia aspires to prepare the nation and its people for the needs of the 21st century, which is aligned with the EFA and MDG goals as mentioned earlier.

Examples of sub-themes for research: Each theme is composed of several sub-themes/issues (such as in the table above) that can be further explored by multiple research endeavours.

All three themes provide insights for the examination of the causes and features of conflicts that arise in any society in order to assess their implications and devise strategies to address them.

This Grand Challenge is part of UM's endeavour to act in the broad social domain and for society. With it, research scholarships and engagements become pivotal towards solving global, regional and local conflicts, especially in multicultural societies through conflict resolution or reduction that emphasises the role of communication as the primary key towards peace and a world without (destructive) conflicts.

SOCIAL COHESION	ENHANCED QOL	EDUCATION & EQUITABLE DEVELOPMENT
• Lack of contact between religions and cultures with relatively little grassroots dialogue • Need for a new attitude and framework in order to understand different religions, cultures etc.	• Improve human resources • Reduce tensions • Strive to do more than tackling extreme poverty and hunger, and achieving basic education and health • The delivery of better living standards through policies, communication, inclusive growth etc.	• Move beyond primary schooling toward advanced universal literacy and numeracy and improve job-related skills • Universal access to information and communication technology (ICT), transportation and energy infrastructure • Education and environmental sustainability, disaster resilience and good global governance • Dynamic, inclusive and sustainable development, etc.

References

Beal, D. J., Cohen, R., Burke, M. J. & McLendon, C. L. (2003). Cohesion and performance in groups: A meta-analytic clarification of construct relation. Journal of Applied Psychology, 88. 989¬–1004.

Carron, A.V., & Brawley, L.R. (2000). Cohesion: Conceptual and measurement issues. Small Group Research 31(1). 89–106.

Communities and Local Government. (n.d.). [State of the English Cities report]. UK: (n.p.).

Gregory, Derek; Johnston, Ron; Pratt, Geraldine; Watts, Michael & Whatmore, Sarah (eds.). (2009). Quality of Life. In Dictionary of Human Geography (5th ed.). Oxford: Wiley-Blackwell.

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. Proceedings of the National Academy of Sciences, 107(38). 16489–16493.

Martha Nussbaum, & Amartya Sen (ed.). (1993). The Quality of Life. Oxford: Clarendon Press

Ministry of Education Malaysia. (2013). Executive Summary: Malaysia Education Blueprint 2013-2025 (Preschool to Post-Secondary Education). Retrieved March 14, 2014, from http://www.moe.gov.my/cms/upload_files/articlefile/2013/articlefile_file_003114.pdf

UNESCO. (n.d.). Education for the 21st Century. Retrieved March 14, 2014, from http://en.unesco.org/themes/education-21st-century

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SUSTAINABILITY SCIENCE RESEARCH CLUSTER

Grand Challenge - Eco-Resilient Cities
Liveable City Research on Urban Mobility

Vision 2020 targets Malaysia as a fully developed country economically, socially, politically and spiritually by the year 2020. As the premier city of the nation, Kuala Lumpur is expected to contribute strongly to the attainment of this great vision. Its current and future physical development should be consistent with the underlying principles of Vision 2020 and to be A World-Class City, which is parallel to the concept of Liveable City. Twelve criteria are used as an indices to assess a Liveable City, including safety, international connectivity, climate, quality of architecture, public transportation, tolerance, environmental issues and access to nature, urban design, business conditions, pro-active policy developments and medical care.

A collaborative three-years research under the Centre of Urban Design, Conservation and Tropical Architecture (UCTA) of Sustainability Science Research Cluster (SuSci), started in 2012 aims to explore challenges and sustainable strategies for Kuala Lumpur towards Liveable City status, specifically to identify significant issues of urban accessibility and mobility, urban regeneration and cultural heritage, urban housing quality, and simultaneously finding strategies towards Liveable City with the smallest carbon foot print.

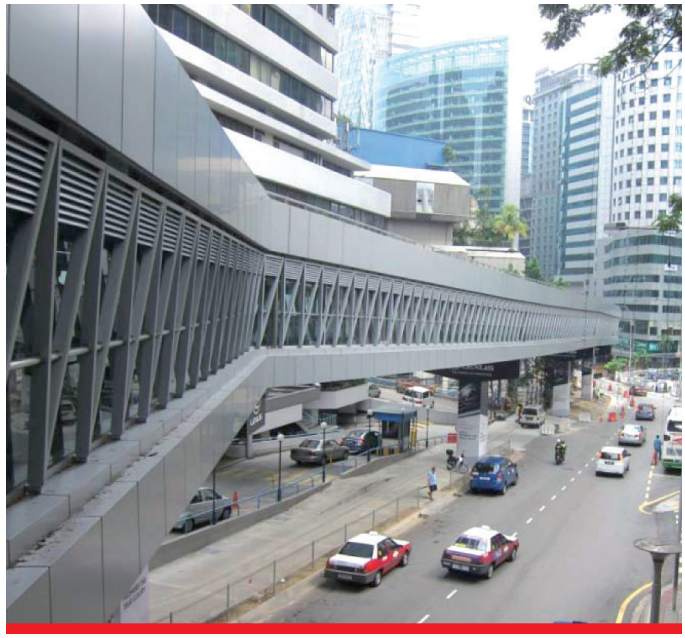

PHOTO 1
Newly completed elevated walkways in KL City Centre has been criticised mainly by the professionals and tourists as insensitive to the existing buildings, monotonous and not appropriately designed.

With reference to urban mobility, cities in general, are facing great challenges that drastically hinder mobility and liveability. Examples include the rising of fuel prices, worsening climatic condition, reduced air quality, growing traffic congestion, inefficiency of public transportation systems, expanding urban sprawl and prevailing obesity epidemic associated with sedentary lifestyle. The concept of auto-centric cities has forgotten of pedestrians and walking possibilities in planning processes thereby creating worsening walking and environmental conditions in cities.

The first research objective of urban accessibility is to raise awareness among stakeholders' for the aspiration of sustainability, as well as their perception and expectation on environmental quality using both qualitative and quantitative methods. Questionnaires, interviews, focus group discussions with stakeholders, visitors and professional planners have so far revealed that safety and security is not the sole issue found in the pedestrian environment that discouraged walking but that comfort and enjoyment play equal roles in pulling people back into urban spaces. In the research, comfort includes connectivity and accessibility of movement spaces and quality of the physical features related to pedestrian facilities while enjoyment covers protection against climate and aesthetic quality that enhance users experience for liveability in the city. This research points out that comfort and enjoyment should be considered on equal footing and simultaneously with safety when designing for a more pedestrian friendly environment to ensure that the citizens gain a better quality of life.

Solutions implemented by the City Hall of Kuala Lumpur such as elevated walkways

SUSTAINABILITY SCIENCE RESEARCH CLUSTER

PHOTO 2
Generally, the elevated walkway is well accepted by users, but the distance covered exceeds the recommended walking radius of 400 m for continuous walking

are primarily meant to protect people from issues of snatch-theft; car accident fatalities, and polluted air, etc. have been challenged in terms of its impact towards the sustainability, aesthetic aspects and quality of the urban fabric. The Pavilion KLCC linkage elevated walkway was accepted well by the users; however the application of mechanical cooling system and security system introduced along the walkway became a maintenance issue to the City Hall of Kuala Lumpur. Other issues raised include structural obstacles on the existing sidewalks at grade rendering the pavement below difficult to use and the truss structure of the elevated walkway obstructing the views from inside out and views from adjacent buildings to outdoor spaces. In addition to the monotony, the distance covered by the elevated walkway exceeds the walking radius of 400 m for continuous walking. The insufficient CCTV cameras create new insecurities among people who use the elevated walkway. Poor integration with the existing built form at the elevated walkways exit points' have caused further marginalisation of certain groups such as the handicapped and children. Further, tourists felt that the design is not in context with the Malaysian culture and tropical climate. (Photo 1 & 2)

Regarding the issue of urban mobility, the study focuses on improving the accessibility and mobility for a quality walking experience in Kuala Lumpur by focusing on walking as a primary mode of travel with an overarching objective to establish a Pedestrian Charter for the City of Kuala Lumpur. To realise this goal, existing mobility by foot, bicycle, public transportation and car has been investigated along with different samples of the population's perception of the different modes of transport.

The research focuses on public's perceptions of incorporating walking with public transport (mixed mode transportation) in a seamless transportation system emphasising on walking in the first (housing areas) and last (city centre) miles of daily travel and using public transport in between. It first investigates the barriers and benefits (economic, social and environmental) of walking. Next, it identifies the characteristics of the urban environment that encourages walking. Finally, it analyses the gap between people's attitude and behaviour in the built environment and how to shift the mind-set and encourage mixed mode transportation on a daily basis.

The findings suggested that the shift in travelling mode from walking and public transport to private motor vehicles was largely due to the deteriorating quality of the pedestrian environment in the city centre, great distance to be covered due to separation of land uses, inadequate public transportation system, weather conditions and the public's negative perception of other transport modes such as walking and public transport.

The research findings suggest that improving the public transportation system as proposed in the NKRA alone will not affect the current travel behaviour of people but a combination of walking and public transport together with policies and campaigns that promote both will bring a positive change in the mind-set and by extension, travel behaviour towards sustainable transportation in Kuala Lumpur.

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EQUITABLE SOCIETY RESEARCH CLUSTER

Grand Challenge
Pushing Economic Borders

The global economy is becoming much more competitive. The emergence of new, highly-competitive regional/global companies has eroded the strong position of Malaysia-based companies especially in the manufacturing and services sector. Other countries are now more competitive than Malaysia in both low-cost production and in high-value markets. As it is, Malaysia is no longer able to remain competitive with low-income countries as a high-volume, low-cost producer. On the other hand, it has yet to moved up the value chain and become competitive with high-income countries. New strategies should therefore be in place in to respond to these challenges.

The Economic Transformation Programme (ETP) embeds the national aspiration of achieving the status of a high-income nation by 2020 involving a comprehensive effort towards lifting Malaysia's Gross National Income (GNI) per capita from USD 6700 (RM23700) as in 2009 to more than USD 15000 (RM48000) by 2020. However, the ETP is not just about a quantitative target, rather it is about Malaysia becoming an advanced and, developed nation with an economy possessing the characteristics of a high-income economy, such as a thriving services sector, a balance between private consumption and investment, as well as comparable productivity levels to those of regional leaders.

However, there are tough challenges ahead, some of which are identified below:

- Lack of high-level competency and expertise (human capital) among professionals/workers in various fields
- Graduates are not innovative and creative enough, and thus are not able to be employed in high-income sectors
- Lack of technology and their skill to produce high-end and high value-added products
- Lack of adequate forward and backward linkage industry in the country (small and medium enterprises), e.g. in Electrical and Electronics, Oil and Gas sectors
- Inadequate training opportunities for employees to upgrade skills and knowledge due to lack of awareness or reluctance of employer to allow/facilitate the process
- Qualified personnel leaving Malaysia for higher pay to other countries such as those in the Middle East
- Inadequate innovation across the economic landscape

In order to achieve the development objectives of the nation, it is highly important that research and development efforts carried out in the country are supportive of the national needs. Under Grand Challenge 5: PUSHING ECONOMIC BORDERS, wide-ranging multi-disciplinary research programmes would be carried out in areas such as innovative product and process development, human resource/skills development, business development, creation of high-income jobs and improvement of national competitiveness.

THE RESEARCH AGENDA

Researchers are urged to address the challenges outlined above through innovative research on the following specific areas:

(i) New Agriculture

Implementation of new agricultural system will help to unlock the potential in biotechnology, increase convergence with information and communications technology (ICT), and encourage participation of entrepreneurial farmers and skilled workforce. Agricultural services also need to be streamlined in order to enhance service delivery and efficiency.

EQUITABLE SOCIETY RESEARCH CLUSTER

Basic drivers of the new agriculture are:

- Agro-biotechnology revolution
  - * Biotechnology crop
  - * Bioeconomy
- The rise of supermarkets
  - * Malaysian flavor
- Reducing poverty and preserving the environment

(ii) Knowledge-based Economy

Knowledge-based economy is a good opportunity to 'leap-frog' to a higher level of growth and competitiveness. The new rules of the borderless world create its own regional advantage and threaten our past track record. Developing new knowledge-intensive industries in the country does not mean abandoning traditional knowledge.

The K-economy helps develop the appropriate human resource in order to increase overall productivity and adaptability. Building the infrastructure for the K-economy will improve the function of the markets in order to unleash the creative power of markets. The private sector can contribute and be proactive in increasing its knowledge capability and knowledge content of its activities and raise its international competitiveness to a new threshold.

(iii) Innovation-based economy

Innovation-based economy is a platform technology to service a broad spectrum of multi-disciplinary sectors including industrial, medical, agricultural and automotive sectors.

Platform technology is a term for technology that enables the creation of products and processes that support present, future or even past development. It establishes the long-term capabilities of research and development institutes. It can be defined as a structural or technological form from which various products can emerge without the expense of a new process/technology introduction. This includes 3D printing, organic and large-area electronics, artificial intelligence and robotics, lab-on-chip, etc.

(iv) Education sector reforms towards producing more competent and relevant human capital. Research needs to inform inputs relating to

- o Good basic education
  - Competency in basic subjects
  - Competency in Science and English Language skills
  - Character building / Self confidence
  - Instilling good values
- o Building a workforce passionate about process technologies, such as
  - Flexible manufacturing systems
  - Just-in-time inventories
  - Statistical quality control
  - Manufacturing to international/global standards
  - Conservation and sustainability
- o Promoting an innovative culture
  - Developing good attitude and work culture
- o Developing comprehensive Human Resource Policies.

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FRONTIER SCIENCE RESEARCH CLUSTER

The New Frontier Science Research Cluster






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Prof. Amir Feisal Merican

The University of Malaya, the first and premier university in the country, has a long tradition of excellence in fundamental research and innovation. University icons such as Royal Professor Ungku Aziz (Economics), Professor Dato' Ahmad Nawawi (Science), Professor Dato' Asmah Haji Omar (Linguistics), Professor Dato' Dr. Goh Sing Yau (Engineering), Professor Datuk Dr. Mohamed Ariff Abdul Kareem (Economics), Professor Tan Sri Dr. T. J. Danaraj (Medicine), Professor Tan Sri Dr. Khoo Kay Kim (History), to name a few, have championed innovative and basic research in their respective disciplines. Since its establishment, the University of Malaya recognized that one of the hallmarks of a world class university is its excellence in basic or fundamental research. This attribute can be seen in other established, world renowned universities, such as Harvard, Stanford, Cambridge, and Oxford. In cognizance of this, in early 2009, the Advanced Fundamental Research (AFR) Cluster was established at the University of Malaya, to spearhead research that will lead to new discoveries and knowledge. Moving forward in a rapidly changing global research landscape, the University's Research and Innovation management team decided to reorganize its research clusters recently to make it more multi- and trans-disciplinary to serve national and societal needs, not however forgetting the university's repute for fundamental research in Malaysia. As a result, early this year the establishment of the Frontier Science Cluster was announced, to foster curiosity driven basic research towards achieving excellence in research and development in the field of Science and Technology, Arts, Social Sciences and Humanities and Economics. This cluster will explore life's fundamental questions and support vibrant and dynamic cutting edge research in the university that will lead to new discoveries, knowledge and policies that will lay the foundation for applied research which will enhance the capacity of the nation and lead to national wealth creation and well-being.

Currently, the Frontier Science Cluster comprises a number of the university's recognized research centres; several originating from the previous Advanced Fundamental Research Cluster. The university centres of research in the cluster highlights the research niche areas in the sciences, at the University of Malaya. At the forefront is the recently established National Centre for Particle Physics, headed by Professor Dr. Wan Ahmad Tajuddin Wan Abdullah. This national centre, which has research links with CERN, the world renowned European

FRONTIER SCIENCE CLUSTER





TOP
Prof Sithi Muniandy
Prof Rauzah Hashim
Prof Ong Seng Huat
BOTTOM
Prof Azman Abd Ghani
Assoc Prof Hasan Abu Kassim

Organization for Nuclear Research in Geneva Switzerland, was set up through the initiative and efforts of Academy of Sciences Malaysia which recognized the University of Malaya's prominence in particle physics. Other research centres include the Low Dimensional Materials Research Centre (LDMRC) headed by Professor Datin Dr. Saadah Abdul Rahman, which focuses research on materials with structure that extend to less than three dimensions. These include materials such as silicon/carbon based, organic, metal oxide, gallium nitride and bio-materials. Next, we have the Centre for Ionics (CIUM), headed by Professor Abdul Kariem Mohd Arof, which carries out fundamental research on polymer electrolytes for lithium ion batteries, proton batteries, supercapacitors, fuel cells, solar cells and electrochromic windows applications. The Plasma Technology Research Centre (UMPTRC) is led by Professor Dr. Wong Chiow San which focuses on the physics and technology of plasma devices such as plasma focus, dusty plasma, vacuum spark capillary discharge, dielectric barrier discharge and others. In the area of biological sciences, the cluster hosts the Mushroom Research Centre (MRC), headed by Professor Dr. S. Vikineswary, which has a rich history of academic excellence under the broader field of mycology. It carries out research on mushroom biology and biotechnology and forward their findings to target groups which include the consumers, mushroom growers, the Department of Agriculture and the Malaysian Mushroom Research Association. Next is the Centre of Research for Computational Sciences and Informatics in biology, bioindustry, environment, agriculture and healthcare (CRYSTAL) which tackle research problems that encompasses various levels of life sciences from molecular to ecosystems such as nucleotide sequence analysis, protein structure and folding, human health and lifestyle, disease prognosis, computational disease mapping, digital soil mapping and the impact of climate change on the survival of organisms. CRYSTAL is headed by Professor Dr. Amir Feisal Merican, from the Bioinformatics unit in the Institute of Biological Sciences, Faculty of Science.

In addition to these centres, five additional research centres are tentatively parked under the cluster and these include the Centre for Fundamental and Frontier Sciences in Nanostructure Self-Assembly, headed by Professor Dr. Rauzah Hashim and the Centre for Theoretical and Computational Physics headed by Professor Dr. Sithi Muniandy. In the mathematical sciences, we have the Centre for Mathematical and Statistical Modelling, headed by Professor. Dr. Ong Seng Huat. Professor Dr. Azman Abd. Ghani leads the Geoscience Research Centre whilst the Quantum Science Centre is headed by Associate Professor Dr. Hasan Abu Kassim.

The cluster hopes future research areas that which will come under the umbrella of the cluster will include basic and fundamental research in the medical sciences, engineering, economics, law, architecture, education, arts, humanities and religious studies. The Cluster's vision and mission, is to enable and strengthen fundamental research in the University of Malaya, to make it internationally renowned and to generate new ideas, discovery and knowledge for the nation and humanity.

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INNOVATIVE TECHNOLOGY RESEARCH CLUSTER

Grand Challenge
Sustainable Resources & Technology

The world in the 21st century undergoes globalization and rapid technology changes. In the midst of these are the uncertainties such as energy prices, exchange rates, political alliances etc. They are followed closely by challenges like climate change, food security, affordable healthcare and sustainable energy.

From the ordinary citizens to the highest level of policymakers, all these uncertainties and challenges become real concerns as it affects livelihood, eco-sphere, financial and international trade, food supply, healthcare, security, military conflicts, water and environmental pollution, law and governance and ultimately the very foundation of civilization and survival of mankind. Recognizing the interrelation and intricacies of these issues, governments, non-governmental organizations, universities, learned societies and professional bodies in the world over identified and outlined their respective Grand Challenges to address these concerns. The theme may be varied, but all of these Grand Challenges shared common traits i.e. they are ambitious but achievable, difficult but inspiring and requires big thinking.

To mitigate and solve some of these issues, there is a need to explore and develop new ideas by working together to turn these ideas into values. Due to the often so complex and big challenges, there is an urgency to collaborate across disciplines of research, and to form partnerships with stakeholders to make progress.

In 2014, University of Malaya as a premier and forward-looking academic institution has developed and outlined its own research Grand Challenges. The five challenges announced are the outcome of careful and extensive considerations. The expertise ranging from an entire spectrum of knowledge from arts and humanities to science and technology are summoned to provide different perspective that preferably integrates into a holistic research approach to solve the problems outlined under the over-arching themes of the university's Grand Challenges. The Grand Challenges are expected to remain relevant domestically and internationally for a foreseeable future. While charting the research priorities and directions at the university in the new millennium, the Grand Challenges also pave a direct route for the public at large to engage and connect with the university's aspiration and goals in the matters of great concern to them. This also enforces the importance of the Malaysian public as the primary funder for research, development and innovation at the university.

The Grand Challenges Program at the University of Malaya is an ambitious and broadly inclusive initiative which addresses not only specific barriers at the national level but also engages issues which concerns the international community using scientific, technological, and public policy dimensions. The Grand Challenges research program calls for multi-, inter- and trans-disciplinary approaches while remaining purpose-driven with collaborative efforts are highly encouraged.

One of the Grand Challenges undertaken by the university is 'Sustainable Resource and Technology'. Innovative Technology Research Cluster oversees the research activities under this Grand Challenge. This is a vast challenge that cannot be addressed fully by a single organization or even a single country. The multi-, inter- and trans-disciplinary research programs are offered to the faculty, students, and researchers opportunities to tackle some of the most pressing issues in the development and application of sustainable resources (biological, physical and energy) and technology, with the broader aim of mitigating environmental degradation and climate changes. The research programs will leverage on the existence of critical mass of expertise existing and superb infrastructure available at the university.

The research themes under the Grand Challenges span into the areas of energy, products from bio-resources, energy and resource efficient technology, and clean manufacturing/production. The research projects are expected to harness ICT as one of the enabling technologies and will integrate science/technology with social sciences.

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HICoE

UM Power Energy Dedicated Advanced Centre (UMPEDAC)





UMPEDAC envisions empowering Malaysia into world leadership in power energy. As one of the nation's first Higher Institutions' Centre of Excellence (HICoE) – and being the sole recipient in the field of engineering, the centre seeks to raise Malaysia's standard of research in power energy across all related fields. UMPEDAC's renewable energy niche has expanded to become multi- and trans-disciplinary – including smart power conversion; renewable energy; smart grid; energy efficiency; smart transportation; power quality and system protection; and automation and control – to meet the global and local technology demands.

As a proponent of science and technology on its way to world leadership, UMPEDAC places extreme importance on its scientific and technological contributions. Among its notable achievements to date, with its industry partners include the technology licensing of 1 kVA, 2 kVA, and 3 kVA single phase grid connected string inverter with EXT Technologies Sdn. Bhd.; developing a stand-alone inverter with Fine Target Sdn. Bhd.; innovation of SCADA system with Prestigious Discovery Sdn. Bhd.; and the research for elevator induction motor with MS Elevator Sdn. Bhd. UMPEDAC's academicians and postgraduates have also published in high impact journals.

Being at the forefront of research for the development of renewable energy, UMPEDAC's main goal is to become a national centre for testing of Photovoltaic (PV) modules, PV cells and high power inverters. Currently UMPEDAC is actively conducting research on solar energy (PV cell, PV module and PV inverter testing, integration system, monitoring system), wind energy (system, mechanical design, monitoring system), solar thermal and smart grid system. Under its spin-off company, the centre offers professional inverter testing services to the industry. The company is in the process of obtaining ISO certification for their inverter testing, PV module & PV cells testing, and motor testing services.

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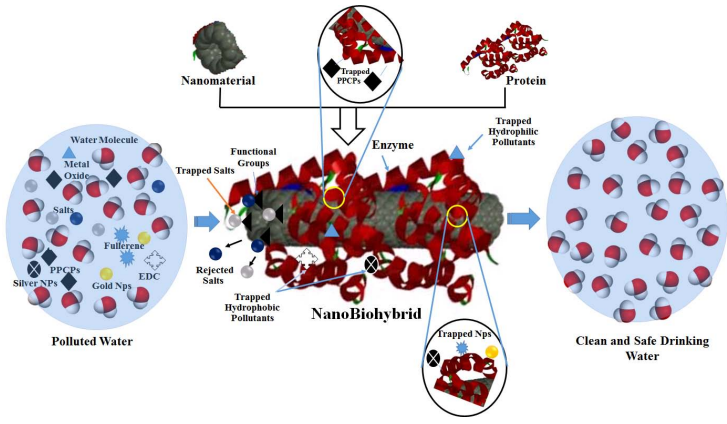
Potential HICoE

Nanotechnology and Catalysis Research Centre (NANOCAT)

Engineered Smart Materials for Next Generation Technologies



The construction and operating principle for the next generation Water Purification membrane.

Smart materials may be defined as engineered nanomaterials whose properties could be significantly changed in a controlled fashion by external stimuli, such as stress, temperature, moisture, pH, electric or magnetic fields. For example, piezoelectric materials produce voltage when stress is applied on it and shape-memory polymer is deformed in response to temperature or other forms of stimuli. Other forms of smart materials include self-healing, magneto-electric, thermoelectric, dielectric, chromogenic, photomechanic and pH sensitive materials.

It has been predicted that future technologies will depend on these super hybrid and designed nanomaterials synthesized via multidisciplinary expertise in physics, chemistry and biology. The marriage between nanomaterials and its biological counterparts has enormous potentials to give birth to bio-inspired hybrid smart materials to meet the next generation technological needs. Although the newly emerging nanomaterials have demonstrated great potentials to overcome the limitations of current engineering technologies, its site specific assembly for highly integrated systems has been remaining a challenging task. Tailoring of multiphase materials at the nanoscale assembly would enhance functionalities for catalysis, drug delivery, targeted cell killing, bioimaging, optoelectronics, energy storage, signal transduction and numerous others applications. Considering the undeniable needs, Nanotechnology and Catalysis Research Centre (NANOCAT) has initiated several projects for the synthesis and application of smart materials with catalysis, sensoring and environmental interests. This short communication has described a smart material with potentials for next generation water purification.

Carbon-based NanoBiohybrid for Next Generation Water Purification

In this project, we focused on the functionalization of nanocarbons (carbon nanotubes, graphene and activated nanocarbons) and immobilization of pollutant trapping receptors and enzymes to tailor a super functioning nanobiohybrid membrane. Such a hybrid membrane would sense, trap and degrade versatile pollutants without producing any fouling or toxic effect to the discharged water. This hybrid membrane would bind, trap, pre-concentrate and catalytically remove both the conventional priority chemicals as well as newly emerging nanomaterials and pharmaceutical and personal care products.

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Potential HICoE

The Photonics Research Centre

The beginnings of the Photonics Research Centre, University of Malaya can be traced back to the establishment of the Laser Laboratory, University of Malaya in 1979. The early years of the laboratory boosts a number of significant achievements, including the initiation of the virtually non-existent field of solid-state lasers. Significant efforts within the laboratory contributed to the development of various solid-state laser systems, many of which were the first to be developed in the region. The knowledge gained here has been crucial in building the country's knowledge base in photonics, and more importantly, provided Malaysia with a major technological advantage over other countries in the region.

The laboratory also initiated and actively pursued studies into optical parametric oscillators, which deals with the complex behavior of how waves interact in optical crystals, and the highly sophisticated systems known as optical parametric amplifiers. Continual research successes emerging from the laboratory led to attention from Telekom Malaysia's R&D division, who subsequently collaborated with the university in 1993 to form the UM-TM Photonics Laboratory. This undertaking was recognized as a part of Telekom Malaysia R&D Division, and TM provided very generous colllaboration funding amounting to RM 10 million per year. UM-TM Photonics laboratory research focused onto communications specific technologies, including fabrication of fused couplers, development of C-band and L-band Erbium-Doped fiber amplifiers, fabrication of Fiber Bragg Gratings, development of optical fiber preform facilities, packaging of optical components and development of an optical test-bed. Services were also provided by the laboratory to the parent company, such as the design and development of monitoring systems for TM optical fiber networks and testing of deployed optical fibers.

Currently the centre has 6 academic staff, 3 research fellows and over 40 research students, most of whom are pursuing doctorate degrees. The centre continually elevates its international standing for scientific and technological research in photonics by performing fundamental and applied research in the area including, but not limited to, optical communication devices, graphene-based photonics devices, optical sensors, optical microfibers, bio-photonics, and nano-photonics. To date, the Photonics Research Centre has filed more than 20 patents and published in excess of 520 articles in ISI-cited journals. This has positioned Photonics Research Centre as a top photonics institution in the world with the highest number of publications in the topic of erbium-doped fiber amplifiers and lasers, as indexed by Thomson Reuters ISI Web of Science. Another significant national contribution of this centre stems from a highly effective photonics-based human capital development; many of the dozens of Ph.D graduates from this centre have gone on to lead their own research in a variety of respective institutions. For these reasons and more, the Photonics Research Centre is widely acknowledged as a significant player on the global photonics stage.

Contact

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Institute of Ocean and Earth Sciences (IOES)

Air-Ocean-Land Interaction Studies and Climate Change Research Unit

Regional Observations at the University Malaya Bachok Marine Research Station Atmospheric Research Laboratory

Observation Tower for Air-Ocean-Land Monitoring at Bachock Marine Research Station, IOES, University of Malaya, Bachok, Kelantan

A new atmospheric research laboratory has been built on the East coast of Kelantan as part of the UM IOES (University of Malaya Institute of Ocean and Earth Sciences) Bachok Marine Research Station. The laboratory is based on a newly constructed tower located on the sea shore facing the South China Sea. The laboratory has been outfitted with an extensive suite of instruments for the study of trace reactive pollutant gases, greenhouse gases, aerosols, halogenated species and meteorological parameters. The laboratory is designed for the investigation of atmospheric land sea exchange processes in South East Asian coastal regions, local and regional atmospheric composition, coastal meteorology and regional scale pollutant transport. The station is suitable for both long term observational studies as well as targeted campaigns looking at specific atmospheric phenomena.

In January of 2014 a research demonstration activity, the IOF campaign (UK National Environmental Research Council International Opportunities Fund) was undertaken. This was based at the Bachok atmospheric research laboratory. This campaign was undertaken by UM in partnership with the Universities of Cambridge and East Anglia and NCAS (UK National Centre for Atmospheric Science). Collaborators from the UK (Universities of East Anglia, Cambridge, York, and Royal Holloway, London), New Zealand (NIWA, New Zealand National Institute of Water and Atmospheric Research), Australia (CSIRO, Commonwealth Scientific and Industrial Research Organisation) and Malaysian partners (Universiti Kebangsaan Malaysia, MetMalaysia) were based at the Bachok station for a month long period post monsoon.

The research campaign was timed to capture the period at the end of the South East Asian winter monsoon to investigate atmospheric composition and variability as well as to attempt to characterise regional and long range transport. This exercise brought together cutting edge instrumentation and expertise to both demonstrate capability and investigate specific scientific issues. One specific area of investigation was the "Tropical Cold Surge" phenomenon. This long range transport effect is associated with outflow from Siberian and Chinese high pressure systems into Southern Asia. These transport events have the potential to transport anthropogenically industrially or combustion polluted air from Northern continental Asia and/or the Indochinese peninsula long distances to the South. Data from this campaign is currently being analysed including with trajectory models and it is hoped that this campaign will result in a better constrained climatology for the region as well as demonstrate the capability of this important new regional monitoring site as well as the importance of its location.

Contact

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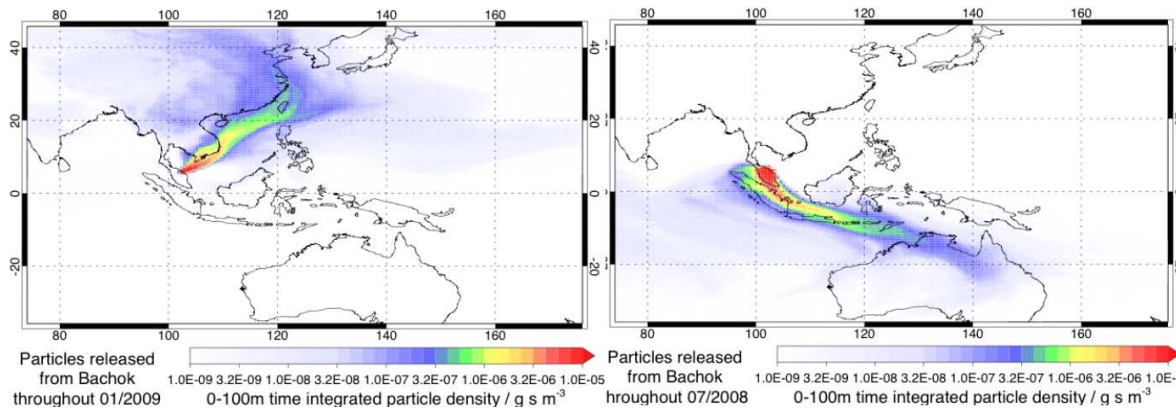
UMCoE

A view of the atmospheric research laboratory used for the IOF campaign. Image shows part of the extensive instrument suite deployed for the period.

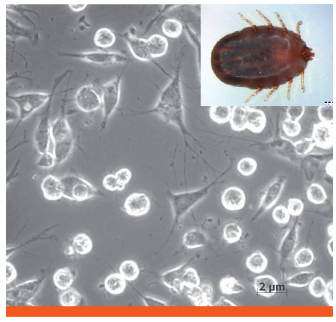


UK NAME back-trajectory analysis for the lowest 100m from Bachok during January 2009 (left) and July 2008 (right). Warmer colours show the chance of air being in that location in the preceding 12 day period (Image Courtesy Dr Neil Harris, University of Cambridge).

UMCoE

Tropical Infectious Diseases Research & Education Centre (TIDREC)

Surveillance, Control and Preventive Measures Against Zoonotic Infections



Samples collection at village of indigenous people

Local tick to be harvested to develop tick cell lines

Contact

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Introduction

The Tropical Infectious Diseases Research & Education Centre (TIDREC) is a dedicated one-stop research centre for the advancement of knowledge in tropical infectious diseases. It recognizes zoonotic infection as a major threat to human health in the tropical region. Zoonotic diseases are contagious diseases spread between infected animals and humans. Transmission may happen directly from animals to human or indirectly through insect as vectors. The most notable zoonotic infection ever recorded in Malaysia would be Nipah virus (NiV) infection which has ~ 40% mortality rate. Mortality cases were recorded throughout the outbreak and colossal economic loss was reported (estimated cost: US$ 97,000,000). NiV was believed to have initially transmitted from fruit bats, the reservoir, to pigs before being transmitted to farm workers who established frequent close contacts with the infected animals. Further studies need to be conducted to prevent and control the outbreak of zoonotic infections in the future.

TIDREC's response

In response to the threat posed by zoonotic infections, TIDREC developed comprehensive diagnostic tools for rapid detection of zoonotic infections. Vaccine studies were also conducted as part of the disease control and preventive measures. Extensive surveillance of zoonotic infections was conducted in communities of indigenous people, who established regular close contacts with wild animals which might be potential reservoir for zoonotic pathogens. Since the communities were mostly located in remote areas all over Malaysia, a tremendous effort was needed to conduct the necessary studies.

Collaborations

In the effort to develop comprehensive diagnostic tools, TIDREC formed collaboration with Pirbright Institute, UK to develop local tick cell lines. The tick cell lines would greatly aid studies on zoonotic infection which utilizes ticks as transmission vector. Additional diagnostic tools to detect pathogens that cause leptospirosis, scrub typhus and spotted fever were obtained from collaborators at Naval Medical Research Center, Bethesda. Collaborations were also formed with entomologists from USM and UM to identify and manage the ticks collected from field trips. With the advancement in molecular identification, it is possible to identify the type of wild animals that serve as reservoir for zoonotic pathogens from the ticks collected. TIDREC is actively seeking collaborations with other research institution to further improve surveillance, control and prevention of tropical infectious diseases. TIDREC aspires to be a renowned research centre for the advancement of knowledge in tropical infectious diseases.

Research Publications based on ISI Web of Science Database

Number of Publications

2006	2007	2008	2009	2010	2011	2012	2013	2014*
399	499	595	1,091	1,643	2,133	2,173	2,436	632

Number of Times Cited

2006	2007	2008	2009	2010	2011	2012	2013	2014*
4,523	5,664	5,086	7,951	9,382	9,302	5,769	2,156	58

Citations / Publication

2006	2007	2008	2009	2010	2011	2012	2013	2014*
11.34	11.35	8.55	7.29	5.71	4.36	2.65	0.88	0.09

h-index

2006	2007	2008	2009	2010	2011	2012	2013	2014*
33	36	33	34	36	33	21	12	3

Research Publications based on Scopus

Number of Publications

2006	2007	2008	2009	2010	2011	2012	2013	2014*
613	695	961	1,377	1,910	2,525	2,700	3,052	939

Number of Times Cited

2006	2007	2008	2009	2010	2011	2012	2013	2014*
6,102	7,455	6,812	9,915	11,896	12,358	7,629	3,203	134

Citations / Publication

2006	2007	2008	2009	2010	2011	2012	2013	2014*
9.95	10.73	7.09	7.20	6.23	4.89	2.83	1.05	0.14

h-index

2006	2007	2008	2009	2010	2011	2012	2013	2014*
34	39	34	36	41	38	23	14	4

*** data compiled as of 30th April 2014**

Source- UM Library

2013 UM Publications indexed in WoS according to PTj – as of 30 April 2014

AUTHOR(S) WITH UM AS AFFILIATION	NO. OF ARTICLES	TOTAL (2436)
FACULTY OF SCIENCE	863	31.04%
FACULTY OF MEDICINE	652	23.45%
FACULTY OF ENGINEERING	643	23.13%
FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY	87	3.13%
PHOTONIC RESEARCH CENTRE	69	2.48%
FACULTY OF DENTISTRY	60	2.16%
POWER ENERGY DEDICATED ADVANCED CENTRE (UMPEDAC)	59	2.12%
FACULTY OF ECONOMICS & ADMINISTRATION	56	2.01%
INSTITUTE OF OCEAN & EARTH SCIENCES (IOES)	40	1.44%
CENTRE FOR RESEARCH IN NANOTECHNOLOGY & CATALYSIS (NANOCAT)	34	1.22%
FACULTY OF ARTS & SOCIAL SCIENCES	33	1.19%
CENTRE FOR FOUNDATION STUDIES IN SCIENCE	29	1.04%
INSTITUTE OF GRADUATE STUDIES	19	0.68%
FACULTY OF LANGUAGES & LINGUISTICS	18	0.65%
FACULTY OF EDUCATION	17	0.61%
FACULTY OF BUSINESS & ACCOUNTANCY	13	0.47%
SPORTS CENTRE	12	0.43%
ASIA-EUROPE INSTITUTE	9	0.32%
NATIONAL ANTARCTICA RESEARCH CENTRE (NARC)	8	0.29%
INSTITUTE OF EDUCATIONAL LEADERSHIP	7	0.25%
ACADEMY OF ISLAMIC STUDIES	7	0.25%
FACULTY OF THE BUILT ENVIRONMENT	7	0.25%
FACULTY OF LAW	6	0.22%
CENTRE OF RESEARCH IN APPLIED ELECTRONICS (CRAE)	6	0.22%
RESEARCH FELLOW	6	0.22%
CENTRE FOR MALAYSIAN INDIGENOUS STUDIES (CMIS)	4	0.14%
SKET	3	0.11%
UNIT ENHANCEMENT ACAD PERFORMANCE (ULPA)	3	0.11%
INSTITUTE OF CHINA STUDIES	2	0.07%
CENTRE FOR CIVILISATIONAL DIALOGUE	2	0.07%
BRIGHT SPARKS	2	0.07%
ACADEMY OF MALAY STUDIES	1	0.04%
CENTRE FOR CREATIVE CONTENT & DIGITAL INNOVATION	1	0.04%
VICE-CHANCELLOR OFFICE	1	0.04%
LIBRARY	1	0.04%
CULTURAL CENTRE	0	0.00%
INPUMA	0	0.00%
Total	2780	100.00%
* Publications refer to: journal articles, review articles		
** Total publications : 2436; 344 publications co-authored from more than 1 PTj		

2014 UM PUBLICATIONS INDEXED IN WOS According to PTj - as of 30th April 2014

AUTHOR(S) WITH UM AS AFFILIATION	NO. OF ARTICLES	TOTAL (632)
FACULTY OF ENGINEERING	214	29.27%
FACULTY OF SCIENCE	202	27.63%
FACULTY OF MEDICINE	126	17.24%
FACULTY OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY	35	4.79%
FACULTY OF DENTISTRY	25	3.42%
POWER ENERGY DEDICATED ADVANCED CENTRE (UMPEDAC)	23	3.15%
CENTRE FOR RESEARCH IN NANOTECHNOLOGY & CATALYSIS (NANOCAT)	22	3.01%
PHOTONIC RESEARCH CENTRE	16	2.19%
FACULTY OF ECONOMICS & ADMINISTRATION	14	1.92%
FACULTY OF ARTS & SOCIAL SCIENCES	7	0.96%
CENTRE FOR FOUNDATION STUDIES IN SCIENCE	7	0.96%
FACULTY OF BUSINESS & ACCOUNTANCY	6	0.82%
FACULTY OF THE BUILT ENVIRONMENT	6	0.82%
FACULTY OF LAW	5	0.68%
INSTITUTE OF OCEAN & EARTH SCIENCES (IOES)	5	0.68%
FACULTY OF EDUCATION	4	0.55%
INSTITUTE OF GRADUATE STUDIES	2	0.27%
FACULTY OF LANGUAGES & LINGUISTICS	2	0.27%
SPORTS CENTRE	2	0.27%
ASIA-EUROPE INSTITUTE	2	0.27%
CENTRE OF RESEARCH IN APPLIED ELECTRONICS (CRAE)	2	0.27%
RESEARCH FELLOW	2	0.27%
INSTITUTE OF EDUCATIONAL LEADERSHIP	1	0.14%
LIBRARY	1	0.14%
ACADEMY OF MALAY STUDIES	0	0.00%
ACADEMY OF ISLAMIC STUDIES	0	0.00%
NATIONAL ANTARCTICA RESEARCH CENTRE (NARC)	0	0.00%
CENTRE FOR MALAYSIAN INDIGENOUS STUDIES (CMIS)	0	0.00%
CULTURAL CENTRE	0	0.00%
INSTITUTE OF CHINA STUDIES	0	0.00%
CENTRE FOR CIVILISATIONAL DIALOGUE	0	0.00%
BRIGHT SPARKS	0	0.00%
SKET	0	0.00%
UNIT ENHANCEMENT ACAD PERFORMANCE (ULPA)	0	0.00%
INPUMA	0	0.00%
Total	731	100.00%

* Publications refer to: journal articles, review articles

** Total publications : 632; 99 publications co-authored from more than 1 PTj

Journal Ranking in Scopus

By: Janaki Sinnasamy, Koh Ai Peng, Library UM

Introduction

There are some differences between Scopus and Web of Science (ISI) when ranking the performance of journals. Firstly, the ranking of Web of Science journals are reported in Journal Citation Reports (JCR) while the ranking of Scopus journals are reported in SCImago Country and Journal Rank. Secondly, journals in the Web of Science have an impact factor as a form of indicator while Scopus uses the algorithm Google Pagerank called SCImago Journal Rank indicator (SJR). Nevertheless, both JCR and SJR use quantitative methods derived from citation metrics to evaluate the performance of a journal.

The SCImago Journal & Country Rank is an open access and the URL is: http://www.scimagojr.com/. It is actually a portal which includes a lot of information related to journals and the country's scientific indicators derived from the information available in the Scopus database. It also measures a journal's impact and prestige by calculating the average number of weighted citations. Figure 1 shows the opening view of SCImago Journal & Country Rank. Information on Journal Rankings, Journal Search, Country Rankings, Country Search, Comparison of Countries/Journals, and Generating a co-citation networks map are the features of this site. This guide is limited to (a) journal rankings, (b) journal search, and (c) comparison by countries.

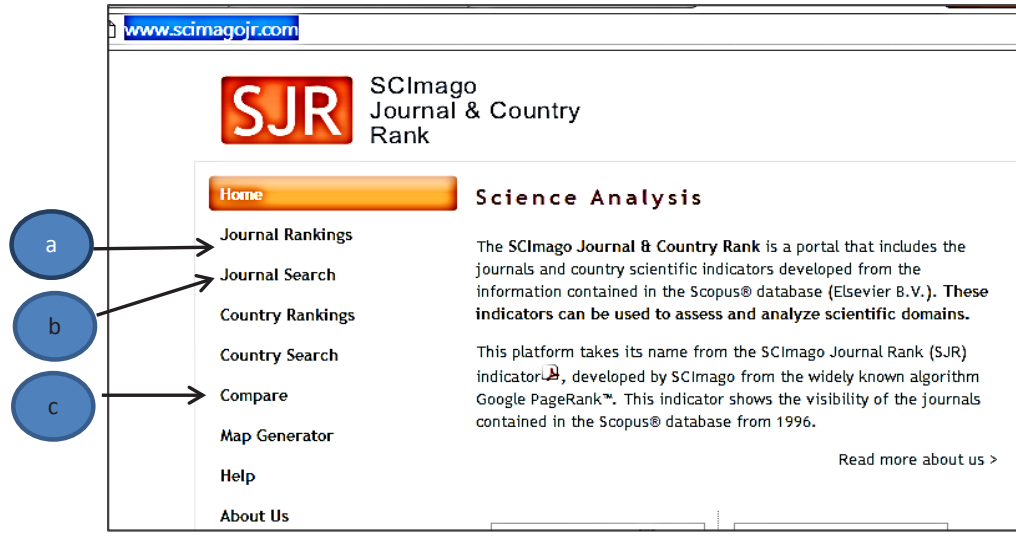
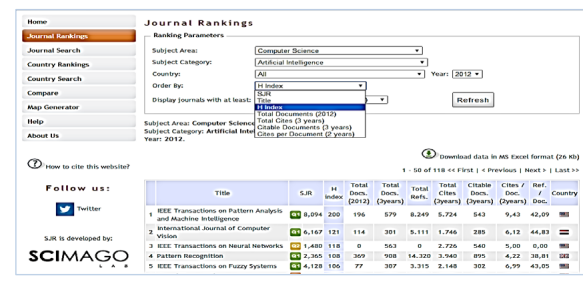


FIGURE 1
Homepage of SCImago Journal & Country Rank at http://www.scimagojr.com/

(a) Journal Rankings

The ranking parameters to search for journal rankings include searching by subject area, subject category and country. The results can be displayed either by SJR (SCImago Journal Rank), title, h-index, total documents for any chosen year, total cites for past three years, and cites per document for the



past two years. The drop down menus enable various combinations of parameters.

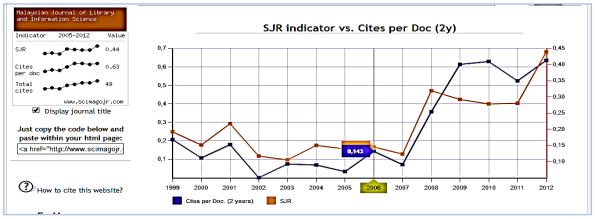
(b) Journal Search

Details of journal

A search can be done by specific journal title. When you click on the chosen journal title, detailed information about the journal will appear such as the country of publication, subject area, subject category, publisher, coverage, and H index value, In addition to this, the indicator for citations per document can also be obtained.

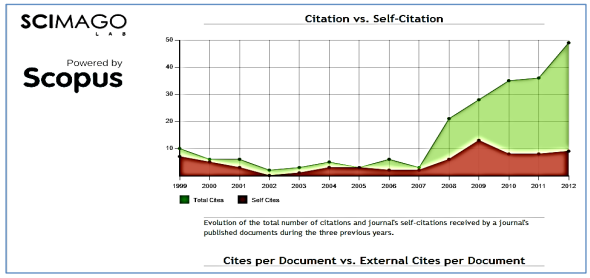
Cites per document (2 years)

A search on a journal title also retrieves the average cites per document in that journal for the past two years. It uses the same formula as calculated by ISI impact factor.



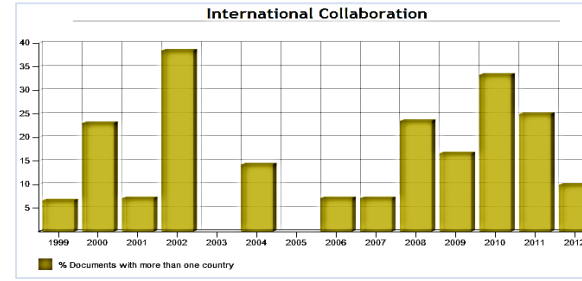
Citations and self-citations

The total number of citations and journal's self-citations received by a journal's published documents during the three previous years can also be retrieved.



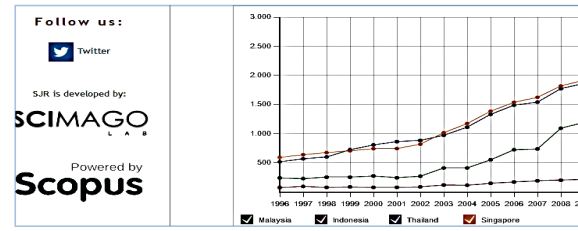
Collaboration

Information on international collaboration for the articles that have been produced by researchers from several countries is also shown. The chart shows the ratio of a journal's documents signed by researchers from more than one country.



(c) Compare performance by countries

Besides evaluation and comparison of journals within any subject area, the performance of countries or regions in selected subject areas / categories can also be done. Select the countries for comparison and subject area, then click on 'Compare'. The documents or papers published in these selected countries, for a certain time period will be displayed which can facilitate further analysis of performance by countries. Other parameters such as self-cites, cites per document, h-index, and international collaborations can also be used to compare the performance of the selected countries.



How to Promote Your Article

Nader Ale Ebrahim
Research Support Unit, Centre of Research Services, IPPP, University of Malaya

Writing an article for online distribution in a way that maximizes the chance of citation hits, is different from preparing one for print journals in some small, but important, respects. To be cited, articles have to be visible in an electronic environment. Therefore, publishing a high quality paper in a scientific journal will be the halfway for receiving citation in the future. The rest of the journey is through advertising and disseminating the publications by using the proper "Research Tools". Familiarity with the tools allows the researcher to increase his/her h-index in a short time. This article provides a list of simple yet effective ways to promote your publications [1-3].

1. Use a unique name consistently throughout academic careers.
2. Use a standardized institutional affiliation and address, using no abbreviations
3. Repeat key phrases in the abstract while writing naturally.
4. Assign keyword terms to the manuscript
5. Optimize your article for Google Scholar and other academic search engines
6. Make a unique phrase that reflects author's research interest and use it throughout academic life
7. The article metadata should be correct (especially author and title).
8. Publish in journal with high impact factor
9. Self-archive articles
10. Keep your professional web pages and published lists up to date (Make an attractive homepage that is clear about what you are working on).
11. Make your research easy to find, especially for online searchers
12. Publish in an Open Access (OA) journal
13. Deposit paper in Open Access repository
14. Publish with international authors
15. Write article collaboratively (Team-authored articles get cited more)
16. Use more references
17. Cite relevant thought influencers in your article (To be the best, cite the best).
18. Publish a longer paper
19. Publish papers with a Nobel laureates
20. Contribute to Wikipedia
21. Start blogging and share your blog post with target customers
22. Share your article on all your social media platforms
23. Interact with your peer connections through academic social media.
24. Keep track of all your international contacts
25. Follow the conversation on academic social media

Source: http://contentmarketinginstitute.com/2011/03/blog-post-to-dos/

26. When your paper is finally published, individually email the pdf copy to selected collaborators
27. Respond to comments.
28. Write a review paper
29. Avoid selecting a question type of title
30. Sharing detailed research data
31. Publish across disciplines
32. Present a working paper
33. Publish your article in one of the journals everyone in your discipline reads
34. Add your latest published article's link to your email signature
35. Take 50 photocopies of your best 1-2 papers to conferences, and leave them on the brochure desk as a handout.
36. Increase number of publications in peer-reviewed journals
37. After a conference, take the paper, correct it, extend it, and submit it to a journal.
38. Publish your work in a journal with the highest number of abstracting and indexing
39. Create a podcast describing the research project
40. Make an online CV Like ORCID or ResearcherID.
41. Publish tutorials papers
42. Follow-up the papers which cited your article
43. Use all "Enhancing Visibility and Impact" tools which are available on http://www.mindmeister.com/39583892/research-tools-by-nader-ale-ebrahim.

References

[1] N. Ale Ebrahim, H. Salehi, M. A. Embi, F. Habibi Tanha, H. Gholizadeh, S. M. Motahar, and A. Ordi, "Effective Strategies for Increasing Citation Frequency," International Education Studies, vol. 6, no. 11, pp. 93-99, October 23, 2013.
[2] N. Ale Ebrahim, H. Salehi, M. A. Embi, F. Habibi Tanha, H. Gholizadeh, and S. M. Motahar, "Visibility and Citation Impact," International Education Studies, vol. 7, no. 4, pp. 120-125, March 30, 2014.
[3] N. Ale Ebrahim, "Introduction to the Research Tools Mind Map," Research World, vol. 10, no. 4, pp. 1-3, June 14, 2013.

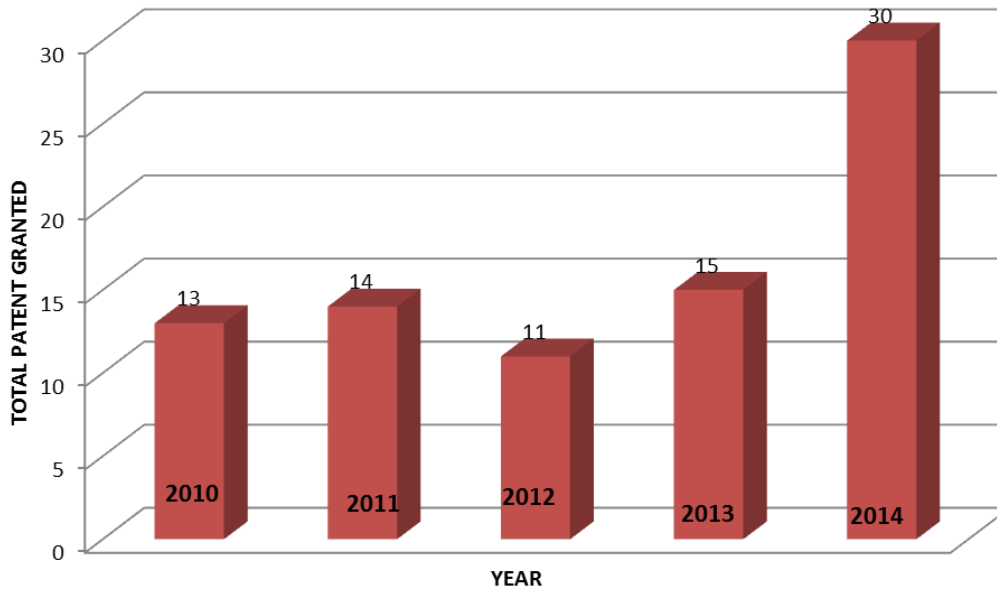
UM Centre of Innovation and Commercialization (UMCIC)

Significant Increase in Patent Granted Status until April 2014

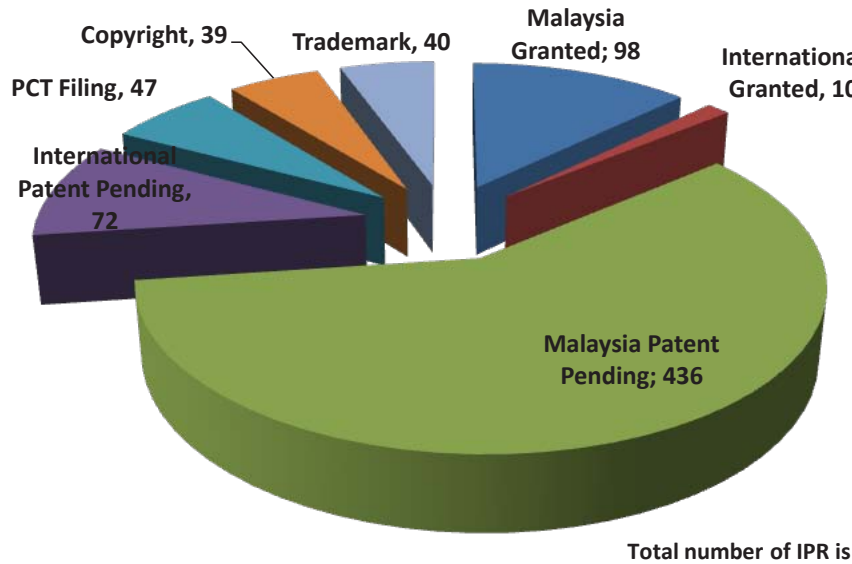
UMCIC (UM Centre of Innovation and Commercialization) would like to take this opportunity to announce that a total of 31 patents were granted until April 2014(first quarter of year 2014). This is a significant increase whereby only 15 patents were granted for the whole of 2013. This is such a great honour for the researchers who were granted the protection for their successful research outcomes. We are glad to be part of this success. UMCIC's Intellectual Property Management Unit is consistently maintaining and performing their tasks by executing their responsibilities in protecting the intellectual assets and managing intellectual property generated by the university. We are committed and confident in achieving positive outcomes by initiating the IPR Strategy plan. Professor Dr. Loo Chu Kiong, Deputy Director of UMCIC (IPR Division), is planning to conduct a patent audit on existing patents granted or filed in University of Malaya. This exercise is expected to reduce the cost of maintaining the patent with priorities given to valuable patents. Concurrently, the evaluation will also assist us to determine those patents that are commercially viable. We hope this year will be a productive one. We have included a table of IPR status & KPI as well as status of IPR managed by UMCIC (as of April 2014).

IPR Status & KPI

No	IPR	KPI/Year	Cumulative 2013	2014	Total
1	PATENTS GRANTED	15	78	31	109
2	PATENTS PENDING	100	416	19	435
3	PCT/INTERNATIONAL		109	10	119
4	(i)COPYRIGHT (excluding original writing) (ii)TRADEMARK (iii)INDUSTRIAL DESIGN (iv)OTHERS IP	100	75	5	80
	TOTAL		**676**	**65**	**743**



Total Number of Patent Granted until April 2014



Status of Ipr Managed by UMCIC (as April 2014)

Total number of IPR is 743

Contact

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Website : umcic@um.edu.my

Research Support Unit Services

Educating

- Inviting prominent scholars to give a lecture on writing and publishing
- Conducting intensive courses on writing, publishing and citation
- Organizing group sessions on writing and producing articles for ISI/WoS-indexed journals
- One-to-one tutorials with authors to help improve/align their draft to meet publication requirements of ISI/WoS-indexed journals

Editing

Editing article for journals

- Submission procedure:
  Manuscript submitted should be double-spacedand in font size 12. All manuscripts are to be sent to uspi@um.edu.my
- Every edited paper incurs charges to the author

Statistical Services & Training Section

Statistical Workshops

To organize workshops to train individuals to analyze data using statistical tools such as SPSS, AMOS, Eviews, Stata, Excel, Mplus and many more.

Statistical Clinics

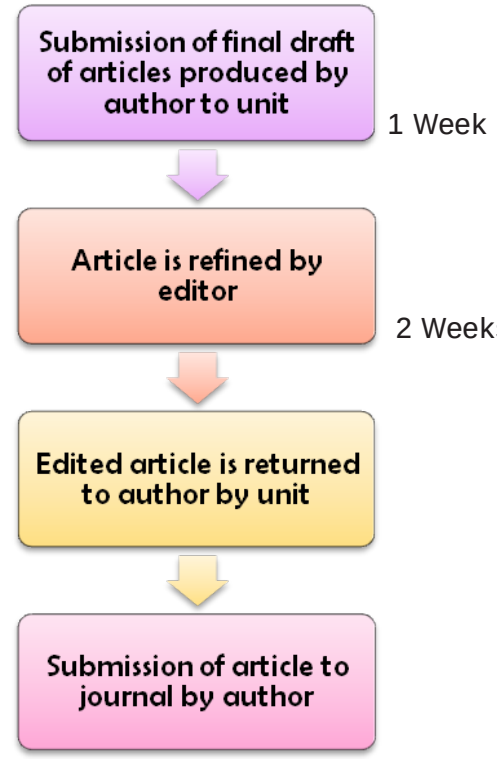
To organize one and the half -hours statistical clinics to facilitate individuals who have problems with the use of SPSS, Eviews or Stata to analyze data.

Statistical 1-1 Consultation

Consultants will routinely provide clients with one-time or ongoing consulting services.

All services are provided at a reasonable fee. For further information please email stat@um.edu.my

FLOW CHART FOR EDITING ARTICLES



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IPPP Research Lab Facilities

NO	FACILITIES	MODEL	RATE (RM)			
			UM User		Non-UM User	
1	Nuclear Magnetic Resonance (NMR)	Jeol Jnm-gsx 270	30.00		60.00	
2	SEM (Sample Preparation)		30.00 (Material sample) 50.00 (Biological Sample)		60.00 (Material sample) 100.00 (Biological Sample)	
3	GCMS	Agilent Technologies	25.00/sample 500.00/year*		50.00/sample	
4	Confocal Laser Microscope	Leica Tcs Sp5 Ii	60.00/hour 500.00/year*		100.00/hour	
5	Field Emission Scanning Electron Microscope (FESEM)	Quanta FEG 450, EDX-OXFORD	**High/ Low Vacuum**	**ESEM/WetStem**	**High/ Low Vacuum**	**ESEM/WetStem**
			180.00/sample (max 7 images) additional image RM20 each	250.00/sample (max 7 images) additional image RM20 each	360.00/sample (max 7 images) additional image RM40 each	500.00/sample (max 7 images) additional image RM40 each
			EDX	**EDX**	**EDX**	**EDX**
			Elemental: 100.00/sample (max 7 spot/area) additional spot/area RM10 each	Elemental: 100.00/sample (max 7 spot/area) additional spot/area RM10 each	Elemental: 200.00/sample (max 7 spot/area) additional spot/area RM20 each	Elemental: 200.00/sample (max 7 spot/area) additional spot/area RM20 each
			Mapping: 100.00/sample (max 3 area) additional area RM10 each	Mapping: 100.00/sample (max 3 area) additional area RM10 each	Mapping: 200.00/sample (max 3 area) additional area RM20 each	Mapping: 200.00/sample (max 3 area) additional area RM20 each
6	Surface Area Analyzer (BET)	Micromeritics ASAP2020, TRISTAR II 3020 Kr	150.00/sample		300.00/sample	
7	Differential Scanning Calorimeter (DSC)	Perkin Elmer (Dsc-8000)	150.00/sample		300.00/sample	
8	Simultaneous Thermal Analyzer (STA)	Perkin Elmer (Sta 6000)	150.00/sample		300.00/sample	
9	Particle Image Velocimetry (PIV)	Dantec Dynamics Nano L135-15piv	From 50.00/experiment (Depend on experiment requirement)		From 100.00/experiment (Depend on experiment requirement)	
10	DNA Sequencer	Applied Biosystems (3730xl DNA Analyzer)	12.00/reaction		24.00/reaction	
11	Real Time PCR	Applied Biosystems Quantstudio (12k Flex Real Time PCR System)	30.00/hour		60.00/hour	
12	Dynamic Mechanical Analyzer	Perkin Elmer	100.00/sample		200.00/sample	

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